

Claims

1. A fluid dispensing device for spraying a fluid into a body cavity comprising a body structure including a housing, a nozzle extending out from an upper end of the housing for insertion into a body cavity, a fluid discharge device
5 moveably housed within the housing, the fluid discharge device comprising a container for storing the fluid to be dispensed having a neck at one end and a compression pump having a suction inlet located within the container and a discharge outlet extending out from the neck of the container for transferring fluid from the pump to the nozzle and at least one lever to apply a force to an
10 actuating means used to move the container towards the nozzle so as to actuate the pump wherein the or each lever is pivotally supported at a lower end within the housing and the actuating means connects to the neck of the container.
2. A fluid dispensing device as claimed in claim 1 in which the actuating means
15 connects to the neck of the container by a collar engaging with the neck of the container.
3. A fluid dispensing device as claimed in claim 1 or in claim 2 in which there are two opposing levers each of which is pivotally supported near a lower end of the housing and is arranged to act upon the actuating means so as to urge
20 the container towards the nozzle when the two levers are squeezed together by a user.
4. A fluid dispensing device as claimed in any of claims 1 to 3 in which the or each lever is pivotally connected to part of the housing.
5. A fluid dispensing device as claimed in claim 2 or in any of claims 3 or 4 when
25 dependent upon claim 2 in which the actuating means comprises of at least one elongate member interposed between a position of connection to the collar and a position of interaction with a respective lever.

6. A fluid dispensing device as claimed in claim 5 in which the position of interaction is a position where an end portion of each elongate member reacts against a stop associated with the respective lever.
7. A fluid dispensing device as claimed in 6 in which the stop is a projection on a surface of the respective lever facing the container.
8. A fluid dispensing device as claimed in claim 7 in which the projection is formed as an integral part of the respective lever.
9. A fluid dispensing device as claimed in claim 6 which the stop is a recess formed in a surface of the respective lever facing the container with which the end portion of the elongate member is engaged.
10. A fluid dispensing device as claimed in any of claims 5 to 9 in which each elongate member is formed as an integral part of the collar.
11. A fluid dispensing device as claimed in any of claims 5 to 10 in which there are two elongate members interposed between each lever and the collar.
12. A fluid dispensing device as claimed in any of claims 5 to 11 in which the container has a longitudinal axis and each elongate member has a longitudinal axis extending between the position of connection to the collar and the position of interaction with the respective lever, the longitudinal axis of each elongate member being arranged at an included angle with respect to the longitudinal axis of the container such that the respective elongate member diverges away from the longitudinal axis of the container as it extends from the position of connection to the collar to the position of interaction with the respective lever.
13. A fluid dispensing device as claimed in claim 12 in which, when the or each lever is moved to cause the container to be moved towards the nozzle, the included angle between the longitudinal axis of each elongate member and the longitudinal axis of the container is reduced.

14. A fluid dispensing device as claimed in any of claims 5 to 13 in which, when each lever is moved to cause the container to be moved towards the nozzle, each elongate member associated therewith is subjected to elastic bending.
- 5 15. A fluid dispensing device as claimed in any of claims 1 to 4 in which the actuating means is at least one resilient flexible member connected to an upper end of each lever so as to hold the or each resilient flexible member in an upwardly bowed state.
16. A fluid dispensing device as claimed in claim 15 in which the or each resilient flexible member is a leaf spring.
- 10 17. A fluid dispensing device as claimed in claim 15 or in claim 16 in which the lower end of the or each lever is pivotally connected to the housing.
18. A fluid dispensing device as claimed in any of claims 15 to 18 in which the or each resilient flexible member is connected to the neck of the container by abutment of an upper surface of the or each resilient flexible member against
15 a collar attached to the neck of the container.
19. A fluid dispensing device as claimed in any of claims 15 to 18 in which a stop means is provided to limit rotational movement of each lever away from the container so as to maintain the or each resilient flexible member in a bowed state.
- 20 20. A fluid dispensing device as claimed in any of claims 15 to 19 in which there is one lever pivotally supported at a lower end within the housing and the or each resilient flexible member is connected at one end to the upper end of the lever and is connected at an opposite end to part of the body structure of the fluid dispensing device.
- 25 21. A fluid dispensing device as claimed in claim 20 in which the part of the body structure is the housing.

22. A fluid dispensing device as claimed in claim 20 when dependent upon claim 19 or in claim 21 when dependent upon claim 19 in which the stop is positioned such that when the lever is displaced fully from the container so as to rest against the stop the linear distance between the upper end of the lever and the position of connection of the or each resilient flexible member to the part of the body structure is less than the un-bowed length of the or each resilient flexible member.
23. A fluid dispensing device as claimed in any of claims 20 to 22 in which the fluid dispensing device further includes an end cap to protect the nozzle and the upper end of the lever is adapted to automatically open the end cap when the lever is moved to cause the container to be moved towards the nozzle.
24. A fluid dispensing device as claimed in claim 23 in which the upper end is adapted by means of a toothed portion formed on the upper end of the lever for engagement with a complementary toothed portion on the end cap.
25. A fluid dispensing device as claimed in any of claims 15 to 19 in which there are two levers each of which is pivotally supported at a lower end within the housing and the or each resilient flexible member is connected at one end to the upper end of one of the two levers and is connected at an opposite end to the upper end of the other of the two levers.
26. A fluid dispensing device as claimed in claim 25 in which the or each resilient flexible member and the two levers are formed as a single integral part.
27. A fluid dispensing device as claimed in claim 25 when dependent upon claim 19 or in claim 26 when claim 25 is dependent upon claim 19 in which each stop is positioned such that when the two levers are displaced fully from the container, so as to rest against their respective stops, the linear distance between the upper ends of the two levers is less than the un-bowed length of the or each resilient flexible member.

28. A fluid dispensing device as claimed in claim 2 in which the fluid discharge device has a longitudinal axis and the actuating means comprises of at least one abutment surface formed on the collar against which at least one actuating surface formed at an upper end of the or each lever is arranged to react wherein at least one of the or each actuating surface and the or each abutment surface is arranged at an angle to the longitudinal axis of the fluid discharge device so as to convert a force applied to the or each lever substantially transversely to the longitudinal axis of the fluid discharge device into a force along the longitudinal axis of the fluid discharge device.
29. A fluid dispensing device as claimed in claim 28 in which a pre-load means is provided to prevent actuation of the compression pump until a pre-determined force is applied to the or each lever.
30. A fluid dispensing device as claimed in either of claims 28 or 29 in which the or each abutment surface is arranged at an angle to the longitudinal axis of the fluid discharge device.
31. A fluid dispensing device as claimed in any of claims 28 to 30 in which the or each actuating surface is arranged at an angle to the longitudinal axis of the fluid discharge device.
32. A fluid dispensing device as claimed in claim 30 in which the or each actuating surface is a curved surface.
33. A fluid dispensing device as claimed in any of claims 28 to 32 in which there are plural abutment surfaces formed on the collar each being located for co-operation with a respective one of two actuating surfaces formed on the or each lever.
34. A fluid dispensing device as claimed in claim 33 in which each lever is U-shaped in cross-section having first and second flanges joined together by a bridging portion.

35. A fluid dispensing device as claimed in claim 33 in which the first flange has an end portion forming a first actuating surface and the second flange has an end portion forming a second actuating surface.
- 5 36. A fluid dispensing device as claimed in any of claims 28 to 35 in which each lever is pivotally supported at a lower end within the housing by a pivotal connection between the lower end of the respective lever and part of the body structure.
37. A fluid dispensing device as claimed in claim 36 in which the part of the body structure is the housing.
- 10 38. A fluid dispensing device as claimed in any of claims 28 to 35 in which each lever is pivotally supported at a lower end within the housing by a flexible strap joining the lower ends of the two levers.
- 15 39. A fluid dispensing device as claimed in any of claims 28 to 38 in which the housing has a front wall, a rear wall and two opposing side walls and at least one of the front wall and the rear wall has an aperture therein to view the level of the fluid in the container.
40. A fluid dispensing device as claimed in any of claims 28 to 39 in which the body structure comprises of a plastic housing and a plastic body member.
- 20 41. A fluid dispensing device as claimed in claim 39 in which the nozzle is formed as an integral part of the plastic body member.
42. A fluid dispensing device as claimed in claim 40 in which the plastic body member is fastened to the housing so that the nozzle projects from the upper end of the housing.
- 25 43. A fluid dispensing device as claimed in any of claims 28 to 42 in which the housing has two apertures formed therein from each of which, in use, a part of a respective one of the levers projects.

44. A fluid dispensing device as claimed in any of claims 28 to 42 in which the body has two apertures formed therein from each of which, in use, a part of a respective one of the levers projects.
45. A fluid dispensing device as claimed in any of claims 1 to 44 wherein the container contains a volume of fluid medicament formulation.
46. A fluid dispensing device as claimed in claim 45 wherein said fluid medicament formulation is in the form of a solution formulation.
47. A fluid dispensing device as claimed in claim 45 wherein said fluid medicament formulation is in the form of a suspension formulation.
48. A fluid dispensing device as claimed in any of claims 45 to 47 wherein the fluid medicament formulation comprises an anti-inflammatory medicament compound.
49. A fluid dispensing device as claimed in claim 48 wherein said medicament compound is a glucocorticoid compound.
50. A fluid dispensing device as claimed in claim 49 wherein said glucocorticoid compound is selected from the group consisting of 6α , 9α -Difluoro- 17α -(1-oxopropoxy)- 11β -hydroxy- 16α -methyl-3-oxo-androsta-1,4-diene- 17β -carbothioic acid S-fluoromethyl ester; 6α , 9α -difluoro- 17α -[(2-furanylcarbonyl)oxy]- 11β -hydroxy- 16α -methyl-3-oxo-androsta-1,4-diene- 17β -carbothioic acid S-fluoromethyl ester; and 6α , 9α -Difluoro- 11β -hydroxy- 16α -methyl- 17α -[(4-methyl-1,3-thiazole-5-carbonyl)oxy]-3-oxo-androsta-1,4-diene- 17β -carbothioic acid S-fluoromethyl ester.

51. A fluid dispensing device as claimed in claim 48 wherein said medicament compound is selected from the group consisting of PDE4 inhibitors, leukotriene antagonists, iNOS inhibitors, tryptase and elastase inhibitors, beta-2 integrin antagonists and adenosine 2a agonists.
- 5 52. A fluid discharge device for use in a fluid dispensing device as claimed in any of claims 1 to 51.
53. A housing assembly for a fluid dispensing device as claimed in any of claims 1 to 51 comprising a housing for moveably supporting a discharge device, a nozzle extending from an upper end of the housing for insertion into a body cavity and at least one lever to apply, in use, a force to the fluid discharging device so as to actuate the fluid discharge device and supply fluid to the nozzle wherein the or each lever is pivotally supported at a lower end within the housing.
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54. An assembly as claimed in claim 53 in which the or each lever is pivotally supported at a lower end within the housing by a pivotal connection between the lower end of the respective lever and the housing.
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55. An assembly as claimed in claim 53 having two levers in which each lever is pivotally supported at a lower end within the housing by a flexible strap joining the lower ends of said two levers.
- 20 56. A fluid dispensing device for spraying a fluid into a body cavity substantially as described herein with reference to the accompanying drawings.
57. A fluid discharge device substantially as described herein with reference to the accompanying drawings.
58. A housing assembly for a fluid discharge device substantially as described herein with reference to the accompanying drawings.
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